

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (currently amended) A reactor fuel bundle, comprising:
 - a channel having at least one inner perimeter wall and a channel longitudinal centerline;
 - at least one support member in contact with said channel;
 - a plurality of fuel rods including both full-length rods and part-length rods each fixedly connectable to said support member and spatially separable from each other by said support member; and
 - said part-length rods being ~~separable~~ divisible into two groups including:
 - a first group having intermediate-length rods each disposed ~~immediately adjacent~~ proximate to said inner perimeter wall; and
 - a second group having short-length rods divisible into two rod sub-groups, each sub-group having three short-length fuel rods arranged in a triangular shape, each of said short-length rods being shorter than said intermediate-length rods;
 - wherein both said two rod sub-groups are disposed ~~approximate~~ proximate to said channel longitudinal centerline.
2. (Original) The fuel bundle of Claim 2, wherein said channel comprises a square-shaped tube having opposed open ends and equal-length sides.

3. (currently amended) The fuel bundle of Claim 3, wherein said fuel rods are disposed in a row-and-column configuration in said square-shaped tube, having equal spacing between ~~adjacent~~ proximate ones of said fuel rods.

4. (currently amended) The fuel bundle of Claim 2, wherein said intermediate-length rods further comprise four rod pairs, each said pair disposed ~~approximately~~ substantially mid-span ~~along~~ proximate one of said equal length sides.

5. (currently amended) The fuel bundle of Claim 1, wherein said channel includes at least one water passage ~~defined~~ defining a tube fixedly connected to said support member and positioned longitudinally between said opposed open ends in said channel and ~~approximately~~ substantially parallel to said channel longitudinal centerline.

6. (currently amended) The fuel bundle of Claim 1, comprising:
said channel includes a pair of water passages ~~defined adjacent~~ each defining a tube fixedly connected to said support member and positioned longitudinally between said opposed open ends in said channel and proximate to said channel longitudinal centerline; and

~~said second group having short-length rods is divisible into two rod subgroups each having three short-length fuel rods disposed approximately~~ proximate both to one of each other and said pair of water passages.

7. (currently amended) The fuel bundle of Claim 1, wherein:

said ~~channel~~ at least one support member further includes both a lower support member fixedly connected to said at least one inner perimeter wall and operable to fixedly support said plurality of fuel rods, and a plurality of horizontal support members;

said plurality of fuel rods each having a lower support end and a distal end, said fuel rods each ~~connectably disposed~~ fixedly connected at said lower support end to said lower support member; and

said plurality of fuel rods being supported from said channel ~~adjacent~~ substantially at each said fuel rod distal end by one of an upper channel end fixedly connected to the channel and a at least one of said plurality of horizontal support members fixedly connected to at least said fuel rods.

8. (currently amended) A reactor fuel bundle providing enhanced reactor shut-down margin, comprising:

a channel having a first end, a second end, and four rectangular configured perimeter walls;

a plurality of fuel rods longitudinally disposed ~~therein~~ within said channel;

a plurality of support members in contact with said perimeter walls and operable to fixedly support said fuel rods;

said fuel rods being divisible into a plurality of full-length fuel rods generally distributed in said channel, a plurality of intermediate-length fuel rods outwardly disposed in said channel and each proximately positioned to one of said perimeter walls, and a plurality of short-length fuel rods ~~inwardly-disposed~~ in said channel inward of said intermediate-length fuel rods, said short-length fuel rods being divisible into two rod sub-groups, each sub-group having three short-length fuel rods arranged in a triangular shape, each of said short-length rods being shorter than said intermediate-length rods;

a plurality of voids defined between a second end of said channel and a distal end of each of said intermediate-length and short-length fuel rods ~~defining voids;~~ and

a connecting end of both said intermediate-length fuel rods and said short-length fuel rods being ~~connectably-disposed~~ fixedly connected to one of said support members positioned at said first end of said channel.

9. (currently amended) The fuel bundle of Claim 8, wherein said intermediate-length fuel rods further comprise a plurality of rod sub-groups each having at least one intermediate-length fuel rod per sub-group.

10. (Original) The fuel bundle of Claim 9, wherein said sub-groups each comprise pairs of intermediate-length fuel rods.

11. (canceled)

12. (currently amended) The fuel bundle of Claim ~~11~~ 10, wherein each said pair of intermediate-length fuel rods has each said intermediate-length fuel rod disposed ~~adjacent~~ proximate to a mid-span ~~thereof~~ of said one of said perimeter walls.

13. (currently amended) The fuel bundle of Claim 8, wherein ~~said channel has four perimeter walls, and~~ said plurality of fuel rods are disposed in a row-and-column configuration within said four perimeter walls.

14. (currently amended) The fuel bundle of Claim 10, wherein each said intermediate-length fuel rod ~~has~~ comprises a length ranging from ~~approximately~~ substantially 60 percent to ~~approximately~~ substantially 90 percent of a length of ~~a~~ one of said full-length fuel rods.

15. (currently amended) The fuel bundle of Claim 10, wherein each said intermediate-length fuel rod ~~has~~ comprises a ~~nominal~~ length ~~approximately~~ substantially 66 percent of a length of a one of said full-length fuel rods.

16. (currently amended) The fuel bundle of Claim 10, wherein each said short-length fuel rod ~~has~~ comprises a length ranging ~~from approximately~~ between substantially 10 percent to ~~approximately~~ substantially 40 percent of a length of a one of said full-length fuel rods.

17. (currently amended) The fuel bundle of Claim 10, wherein each said short-length fuel rod ~~has~~ comprises a ~~nominal~~ length ~~(E) approximately~~ substantially 33 percent of a length of a one of said full-length fuel rods.

18. (withdrawn) A reactor fuel bundle, comprising:
a channel having four contiguous inner perimeter walls and a channel longitudinal centerline;
a plurality of fuel rods including both full-length fuel rods and part-length fuel rods;
said part-length fuel rods being separable into two groups including,
a first group having intermediate-length fuel rods disposed immediately adjacent to one of said inner perimeter walls; and
a second group having short-length fuel rods disposed approximate to said channel longitudinal centerline; and

an odd number of said fuel rods disposed adjacent to each of said inner perimeter walls.

19. (withdrawn) The fuel bundle of Claim 18, wherein said intermediate-length fuel rods further comprise four rod subsets, each said subset having at least one intermediate-length fuel rod disposed at an approximate mid-span point along one of said inner perimeter walls.

20. (withdrawn) The fuel bundle of Claim 18, wherein said second group of short-length fuel rods further comprises two subgroups each having at least one short-length fuel rod disposed immediately adjacent to one of a pair of water passages defined in the channel.